

Crude oil prices followed a fluctuating trend in the international market in 2016, bringing the total average price of each barrel to less than 2015 levels. Several different factors including the tensions emerging in oil-producing regions, the agreement between the OPEC member countries and non-members for reducing the production level as well as converging crude oil supply and demand in the global market, and depreciation of the US dollar vis-à-vis other hard currencies were responsible for the increase in crude oil prices in 2016. On the other hand, continued excess crude oil supply and low demand in the international market, increase in the production and supply of unconventional oils, buildup of US crude stocks, and reduction in demand for crude oil by developing economies resulting from higher consumption of green fuels were among factors that led to a fall in the price of crude oil.

In the year 2016, three Meetings of the OPEC Conference were held. The 169th Meeting of the OPEC Conference was held in Vienna, Austria, on June 2, 2016, during which the OPEC production ceiling was kept unchanged at 30.0 mb/d. This Meeting came to a consensus on a new secretary general after almost a decade, appointing Mohammed Sanusi Barkindo from Nigeria as Secretary General of the OPEC for a period of three years, with effect from August 1, 2016.

At the 170th (Extraordinary) Meeting of the OPEC Conference convened in Algiers,

Algeria, on September 28, 2016, member countries decided to conduct a constructive dialogue with non-member producing countries about production with the objective to stabilize the oil market. Meanwhile, the Conference opted for a production target ranging between 32.5 and 33.0 mb/d in order to accelerate the ongoing downtrend of the excess stock and bringing balance back to the oil market. At the 171st Meeting held in Vienna on November 30, 2016, member countries confirmed their commitment to the new production target of 32.5 mb/d.

OPEC

Primary Energy Consumption

Primary energy consumption by the OPEC member countries increased from 873.2 million tons oil equivalent in 2015 to 886.9 million tons oil equivalent in 2016. Among primary energy sources, crude oil and natural gas are consumed by member countries largely while others are used sparingly. The lowest amount of consumption was related to nuclear energy and renewable energies in 2016. Middle East members (Saudi Arabia, Iran, Kuwait, United Arab Emirates, and Qatar), with a total consumption of 741.9 million tons oil equivalent, accounted for higher consumption as compared with the other members (Venezuela, Ecuador, and Algeria). Iran, with 270.7 million tons oil equivalent, ranked first in terms of primary energy consumption in 2016, followed by

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Saudi Arabia with 266.5 million tons oil equivalent.

Crude Oil Proven Reserves

At end-2016, crude oil proven reserves located in OPEC member countries reached 1,220.5 billion barrels, representing 0.8 percent increase compared with 2015 year-end. Among OPEC member countries, the largest reserves by 300.9 billion barrels belonged to Venezuela, followed by Saudi Arabia with 266.5 billion barrels. Iran, with 158.4 billion barrels, ranked third among OPEC member countries.

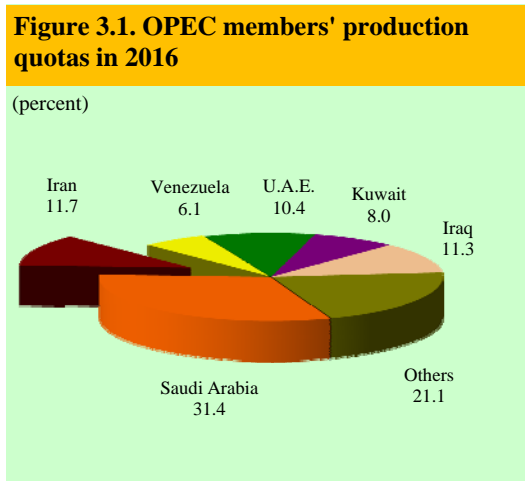


Table 3.1. OPEC Primary Energy Consumption in 2016¹

(million tons oil equivalent)

	Crude oil	Natural gas	Coal	Nuclear energy	Hydroelectricity	Renewable energies	Total
Middle East members	328.9	405.3	3.1	1.4	2.9	0.2	741.9
Saudi Arabia	167.9	98.4	0.1	0.0	0.0	0.0	266.5
Iran	83.8	180.7	1.7	1.4	2.9	0.1	270.7
Kuwait	22.0	19.7	0.0	0.0	0.0	0.0	41.7
United Arab Emirates	43.5	69.0	1.3	0.0	0.0	0.1	113.8
Qatar	11.7	37.5	0.0	0.0	0.0	0.0	49.2
Other members	58.6	68.6	0.2	0.0	17.4	0.2	145.1
OPEC	387.6	473.9	3.3	1.4	20.3	0.4	886.9

Source: BP Statistical Review of World Energy 2017.

¹Excludes Iraq, Nigeria, Libya, and Angola.

Table 3.2. OPEC Crude Oil Proven Reserves

(billion barrels)

	Year-end			Percentage change		Share (percent)	
	2014	2015	2016	2015	2016	2015	2016
Middle East members	792.9	792.0	802.4	-0.1	1.3	65.4	65.7
Saudi Arabia	267.0	266.6	266.5	-0.2	0.0	22.0	21.8
Iran	157.8	158.4	158.4	0.4	0.0	13.1	13.0
Iraq	143.1	142.5	153.0	-0.4	7.4	11.8	12.5
Kuwait	101.5	101.5	101.5	0.0	0.0	8.4	8.3
United Arab Emirates	97.8	97.8	97.8	0.0	0.0	8.1	8.0
Qatar	25.7	25.2	25.2	-1.8	0.0	2.1	2.1
Other members	418.2	418.3	418.1	0.0	-0.1	34.6	34.3
OPEC	1,211.1	1,210.3	1,220.5	-0.1	0.8	100.0	100.0

Source: BP Statistical Review of World Energy 2017.

Crude Oil Production

In 2016, average OPEC crude oil production, with 3.2 percent increase compared with 2015, amounted to 39.4 mb/d. Production of OPEC Middle East members, with 6.0 percent growth, totaled 30.5 mb/d and production of other members fell by 5.5 percent to 8.8 mb/d. The highest amount of production was related to Saudi Arabia with 12.3 mb/d and a share of 31.4 percent in total OPEC crude oil production.

Crude Oil Consumption

In 2016, the average crude oil consumption in OPEC member countries¹ amounted to 8.8 mb/d, indicating 0.6 percent increase compared with 2015. The highest amount of consumption by 3.9 mb/d was related to Saudi Arabia. Ecuador, with 0.2 mb/d, accounted for the lowest amount of crude oil consumption in 2016. Iran's consumption was 1.8 mb/d, constituting 20.9 percent of total OPEC consumption².

Table 3.3. OPEC Crude Oil Production¹

(thousand b/d)

	2014	2015	2016	Percentage change		Share (percent)	
				2015	2016	2015	2016
Middle East members	27,176.7	28,800.5	30,538.1	6.0	6.0	75.5	77.6
Saudi Arabia	11,504.7	11,986.0	12,349.3	4.2	3.0	31.4	31.4
Iran ²	3,725.3	3,897.1	4,599.9	4.6	18.0	10.2	11.7
Iraq	3,285.3	4,031.0	4,465.1	22.7	10.8	10.6	11.3
Kuwait	3,101.3	3,068.2	3,151.4	-1.1	2.7	8.0	8.0
United Arab Emirates	3,673.9	3,927.7	4,073.3	6.9	3.7	10.3	10.3
Qatar	1,886.2	1,890.5	1,899.1	0.2	0.5	5.0	4.8
Other members	9,395.8	9,332.0	8,819.8	-0.7	-5.5	24.5	22.4
OPEC	36,572.5	38,132.6	39,357.9	4.3	3.2	100.0	100.0

Source: BP Statistical Review of World Energy 2017.

¹ Includes NGL, shale oil, and oil sands.

² BP data on Iran's crude oil production are overestimated. According to the Ministry of Petroleum, the amount of Iran's crude oil production totaled 3.8 mb/d in 2016.

Table 3.4. OPEC Crude Oil Consumption¹

(thousand b/d)

	2014	2015	2016	Percentage change		Share (percent)	
				2015	2016	2015	2016
Middle East members	7,318.6	7,465.3	7,579.9	2.0	1.5	84.9	85.7
Saudi Arabia	3,725.8	3,868.0	3,905.6	3.8	1.0	44.0	44.2
Iran ²	1,960.6	1,850.4	1,848.2	-5.6	-0.1	21.0	20.9
Kuwait	479.6	505.6	499.2	5.4	-1.3	5.7	5.6
United Arab Emirates	860.1	925.8	987.5	7.6	6.7	10.5	11.2
Qatar	292.6	315.6	339.4	7.9	7.5	3.6	3.8
Other members	1,369.7	1,327.5	1,262.5	-3.1	-4.9	15.1	14.3
OPEC³	8,688.3	8,792.8	8,842.4	1.2	0.6	100.0	100.0

Source: BP Statistical Review of World Energy 2017.

¹ Includes domestic demand for crude oil, aviation and marine fuels, fuel for refineries and oil wastes.

² Data related to Iran are overestimated.

³ Excludes Iraq, Nigeria, Libya, and Angola.

¹ Excludes Iraq, Nigeria, Libya, and Angola.

² Estimates released by the BP are higher than figures published by the Ministry of Petroleum.

Natural Gas Proven Reserves

OPEC natural gas proven reserves reached 94.8 trillion cubic meters at end-2016, remaining unchanged compared with the previous year-end. Iran and Qatar, with 33.5 and 24.3 trillion cubic meters, had the largest reserves among member countries.

Natural Gas Production¹

OPEC natural gas production amounted to 753.7 billion cubic meters in 2016, up by 3.4 percent. Iran, with a production of 202.4 billion cubic meters, enjoyed the highest share of OPEC natural gas production by

26.9 percent. Qatar, with a production of 181.2 billion cubic meters of natural gas and a share of 24.0 percent, ranked second.

Natural Gas Consumption

OPEC natural gas consumption amounted to 526.6 billion cubic meters in 2016, showing 3.5 percent rise compared with the previous year. Consumption of natural gas by Middle East members reached 450.4 billion cubic meters, up by 3.7 percent compared with 2015 and constituting 85.5 percent of total consumption.

Table 3.5. OPEC Natural Gas Proven Reserves (trillion cubic meters)

	Year-end			Percentage change		Share (percent)	
	2014	2015	2016	2015	2016	2015	2016
Middle East members	78.4	77.8	77.8	-0.8	0.0	82.1	82.1
Saudi Arabia	8.3	8.4	8.4	1.2	0.0	8.9	8.9
Iran	34.0	33.5	33.5	-1.5	0.0	35.3	35.3
Iraq	3.7	3.7	3.7	0.0	0.0	3.9	3.9
Kuwait	1.8	1.8	1.8	0.0	0.0	1.9	1.9
United Arab Emirates	6.1	6.1	6.1	0.0	0.0	6.4	6.4
Qatar	24.5	24.3	24.3	-0.9	0.0	25.6	25.6
Other members	17.0	17.0	17.0	0.3	0.0	17.9	17.9
OPEC¹	95.4	94.8	94.8	-0.6	0.0	100.0	100.0

Source: BP Statistical Review of World Energy 2017.

¹Excludes Angola and Ecuador.

Table 3.6. OPEC Natural Gas Production (billion cubic meters)

	2014	2015	2016	Percentage change		Share (percent)	
				2015	2016	2015	2016
Middle East members	532.5	550.4	573.2	3.4	4.1	75.5	76.0
Saudi Arabia	102.4	104.5	109.4	2.0	4.7	14.3	14.5
Iran	185.8	189.4	202.4	1.9	6.9	26.0	26.9
Iraq	0.9	1.0	1.1	10.8	12.9	0.1	0.2
Kuwait	15.0	16.9	17.1	12.5	1.3	2.3	2.3
United Arab Emirates	54.2	60.2	61.9	10.9	2.8	8.3	8.2
Qatar	174.1	178.5	181.2	2.5	1.6	24.5	24.0
Other members	168.3	178.9	180.6	6.3	0.9	24.5	24.0
OPEC¹	700.7	729.3	753.7	4.1	3.4	100.0	100.0

Source: BP Statistical Review of World Energy 2017.

¹Excludes Angola and Ecuador.

¹Includes commercial production and consumed gas.

Table 3.7. OPEC Natural Gas Consumption¹

(billion cubic meters)

	2014	2015	2016	Percentage change		Share (percent)	
				2015	2016	2015	2016
Middle East members	406.9	434.3	450.4	6.7	3.7	85.3	85.5
Saudi Arabia	102.4	104.5	109.4	2.0	4.7	20.5	20.8
Iran	183.7	190.8	200.8	3.9	5.3	37.5	38.1
Kuwait	18.5	21.3	21.9	15.5	2.8	4.2	4.2
United Arab Emirates	65.9	73.8	76.6	11.9	3.9	14.5	14.6
Qatar	36.4	43.9	41.7	20.6	-5.2	8.6	7.9
Other members	68.9	74.5	76.2	8.2	2.2	14.7	14.5
OPEC	475.8	508.8	526.6	6.9	3.5	100.0	100.0

Source: BP Statistical Review of World Energy 2017.

¹Excludes Iraq, Nigeria, Libya, and Angola.

Iran

Production and Exports of Crude Oil

According to the Ministry of Petroleum, Iran's average crude oil production increased in adherence to the production quotas set by the OPEC to reach 3.8 mb/d in 1395. This was 16.4 percent higher than 1394. Iran's crude oil exports rose 48.6 percent to 2.1 mb/d while exports of oil products decreased by 16.7 percent to 146.3 thousand b/d. Iran's medium crude oil spot price went up by 2.4 percent to \$46.0 a barrel on average.

Domestic consumption of oil products reached 1,503.3 thousand b/d in 1395, down by 2.7 percent compared with 1394. Consumption of gas oil and gasoline reached 484.7 and 443.9 thousand b/d, accounting for respectively 32.2 and 29.5 percent of total consumption of oil products.

Natural Gas

With the development of gas supply infrastructure in urban and rural areas, domestic consumption of natural gas rose 7.3 percent to 193.5 billion cubic meters in 1395. The share of "residential, commercial, and industrial sectors" in total natural gas consumption was 50.7 percent, "power plants" 31.6 percent, and "major industries" 17.7 percent.

Electricity

In 1395, Iran's electricity generation amounted to 289.2 billion kWh, showing 3.1

percent growth compared with the year before. Of total generated electricity, 154.4 billion kWh (53.4 percent) was related to the power plants affiliated to the private sector, 128.3 billion kWh (44.4 percent) to the Ministry of Energy, and 6.5 billion kWh (2.2 percent) to large industries. The highest amount of generated electricity by 80.8 billion kWh was related to the combined cycle power plants affiliated to the private sector, followed by steam power plants affiliated to the Ministry of Energy (60.8 billion kWh). The amount of electricity generated by power plants affiliated to the Ministry of Energy experienced 4.2 percent increase in 1395. Among power plants affiliated to the Ministry of Energy, the highest rise in electricity generation by 35.6 percent was related to hydroelectric, diesel, wind, and nuclear power plants.

Electricity consumption amounted to 237.4 billion kWh in 1395, up by 4.2 percent compared with 1394. The highest growth of consumption was related to street lighting by 17.0 percent. All other sectors including industrial, commercial, public, residential, and agriculture sectors also showed 6.7, 5.6, 3.2, 3.0, and 0.4 percent rise, respectively, compared with the year before. Residential and industrial sectors enjoyed the highest shares in electricity consumption by 33.0 and 32.7 percent.

5th Five-Year Development Plan (1390-1395)

Due to the significant role that oil plays in the economic performance of the country, 5th FYDP casts a special look on the energy sector, especially the oil and gas sector. For better utilization of oil and gas resources and with the aim of stimulating GDP growth, certain Articles in the 5th Plan were specifically devoted to the oil and gas sector. Targets such as development of oil and gas fields and rise in production while protecting the capacities (Article 125), identification and exploration of oil and gas and the use of new technologies for exploratory operations (Article 126), completion of "Persian Gulf Star" and "Fars" natural gas condensate refineries with nominal capacities of respectively 360 thousand and 120 thousand barrels (Article 127), investment in private and cooperative oil and gas sector (Article 128), employment of experts for exploration, development, and extraction of oil and gas (Article 129), and increase in the oil recovery factor of the reservoirs (Article 130) were among the objectives included in the 5th FYDP.

Crude Oil

During the course of the 5th FYDP, the performance of the oil and gas sector (particularly oil exports) was adversely affected by the international sanctions imposed on Iran in the aftermath of the escalation of

political tensions related to Iran's nuclear program. Average crude oil exports were at their lowest level of 1.3 mb/d in 1393. Average crude oil production amounted to 3.5 mb/d over the course of the Plan. The average crude oil exports equaled 1.7 mb/d during this period, indicating a reduction by about 296.0 thousand b/d when compared with the exports of 1389 at 2.0 mb/d. In the year 1395, the first year after the conclusion of the nuclear deal with the P5+1 and the implementation of the JCPOA, sanctions on the oil sector were rather lifted and Iran managed to reclaim its share in the global market. As a result, exports of Iran's crude oil increased from 1.4 mb/d in 1394 to 2.1 mb/d in 1395. Over the years of the Plan, the amount of daily production and exports both indicated an annual average growth rate of about 1.0 percent.

Oil Products¹

The production of four main oil products experienced an annual average growth rate of 1.8 percent, increasing from 1,317.1 thousand b/d in 1389 to 1,466.5 thousand b/d in 1395. The amount of production during 1390-1395 period averaged 1,547.5 thousand b/d. Consumption of the mentioned products amounted to 1,399.2 thousand b/d in 1395, up from 1,321.2 thousand b/d in 1389,

Table 3.8. Performance of Oil Sector during the 5th FYDP (thousand b/d)

	Base year	Performance						Average performance (1390-1395)	Annual average growth (percent)
	1389	1390	1391	1392	1393	1394	1395		
Production	3,535.8	3,618.7	3,731.8	3,481.2	3,063.0	3,230.9	3,761.9	3,481.2	1.0
Exports	2,021.0	2,032.7	1,803.1	1,605.7	1,342.7	1,433.9	2,130.7	1,724.8	0.9

Source: Ministry of Petroleum.

¹ Includes gasoline, gas oil, kerosene, fuel oil, liquefied gas, and other oil products.

which indicates an annual average growth rate of 1.0 percent. Accordingly, exports of oil products surged from the average of 81.0 thousand b/d to 146.3 thousand b/d, showing 10.4 percent annual increase on average. Rise in the exports of oil products over the course of the 5th FYDP was largely attributable to the increase in the exports of fuel oil. Over the years of the 5th Plan, imports of oil products indicated an annual average decline of 10.1 percent, mainly due to the annual average 6.2 percent decrease of gasoline imports.

Natural Gas

During the years of the 5th FYDP, average production of natural gas indicated an annual growth rate of 3.9 percent, rising from 617.4 million cubic meters per day in 1389 to 778.9 million cubic meters per day in 1395. Meanwhile, the amount of gas injection into oil wells, with an annual average decrease of 1.2 percent, declined from 88.4 million

cubic meters in 1389 to 82.1 million cubic meters per day in 1395. Based on relevant data, an average of 81.2 million cubic meters of gas was injected into oil reservoirs on a daily basis during 1390-1395 period. On this basis, the net amount of produced natural gas (production minus injection) increased from 529.0 million cubic meters in 1389 to 696.8 million cubic meters per day in 1395, indicating an annual average growth rate of 4.7 percent.

Exports of natural gas grew by an annual average rate of 1.1 percent, increasing from 23.3 million cubic meters in 1389 to 24.8 million cubic meters per day in 1395. Imports of natural gas decreased from 24.7 million cubic meters to 16.1 million cubic meters per day, showing an annual average decline of 6.9 percent in the same period. The number of natural gas residential and commercial customers, with an annual average growth rate of 8.3 percent, increased from 13.2 million in 1389 to 21.3 million in 1395.

Table 3.9. Performance of Oil Products during the 5th FYDP (thousand b/d)

	Base year	Performance						Annual average growth (percent)
	1389	1390	1391	1392	1393	1394	1395	
Production of four main oil products ¹	1,317.1	1,390.0	1,658.3	1,679.6	1,531.0	1,558.8	1,466.5	1.8
Consumption of four main oil products ¹	1,321.2	1,335.0	1,571.0	1,618.8	1,475.6	1,463.1	1,399.2	1.0
Exports of oil products	81.0	88.0	103.6	99.2	119.1	175.7	146.3	10.4
Imports of oil products	100.3	13.5	6.9	20.4	27.1	35.9	52.8	-10.1

Source: Ministry of Petroleum.

¹ Includes gasoline, gas oil, kerosene, and fuel oil.

Table 3.10. Performance of Gas Sector during the 5th FYDP

	Base year	Performance						Annual average growth (percent)
	1389	1390	1391	1392	1393	1394	1395	
Production of natural gas (million cubic meters a day)	617.4	631.1	622.2	634.8	681.8	718.8	778.9	3.9
Gas injection (million cubic meters a day)	88.4	86.9	77.7	81.9	72.2	86.4	82.1	-1.2
Gas imports (million cubic meters a day)	24.7	32.4	12.8	14.7	20.6	24.8	16.1	-6.9
Gas exports (million cubic meters a day)	23.3	26.0	25.5	25.4	26.6	23.5	24.8	1.1
Number of gas customers (million)	13.2	14.8	16.3	17.5	18.8	20.1	21.3	8.3

Source: Ministry of Energy, NIGC, and Energy Sector Data in 28 Years released in Esfand 1395.

Electricity

The amount of electricity generated by power plants (gross) indicated an annual average increase of 3.7 percent, rising from 233.0 billion kWh in 1389 to 289.2 billion kWh in 1395. The number of electricity residential and commercial customers reached 33.8 million in 1395, up from 25.7 million in 1389, showing 4.7 percent annual average growth over the course of the Plan. Accordingly, the amount of electricity consumed by various sectors, with an annual average increase of 4.3 percent, totaled 237.4 billion kWh in 1395, up from 184.2 billion kWh in 1389. In line with Article 44 of the Constitution, a large number of power

plants under the supervision of the Ministry of Energy were privatized in 1392, reducing the nominal capacity and actual output¹ of plants affiliated to the Ministry of Energy by an average of 5.5 and 5.1 percent, respectively, over the course of the Plan. As a result, the capacities of power plants affiliated to the private sector increased, raising the total amount of electricity output all over the country. Total actual output of power plants (affiliated to the Ministry of Energy and the private sector) increased from 54.1 thousand MW in 1389 to 66.6 thousand MW in 1395, showing an annual average growth rate of 3.5 percent.

Table 3.11. Performance of Electricity Sector during the 5th FYDP

	Base year	Performance						Annual average growth (percent)
	1389	1390	1391	1392	1393	1394	1395	
Electricity customers (million)	25.7	27.2	28.8	30.3	31.7	32.8	33.8	4.7
Gross electricity generation (billion kWh)	233.0	240.1	254.3	262.4	274.4	280.6	289.2	3.7
Sales of electricity (billion kWh)	184.2	183.9	194.1	203.2	219.7	227.8	237.4	4.3
Nominal capacity of power plants (thousand MW)	61.2	65.2	68.9	70.3	73.2	74.1	76.4	3.8
Actual output of power plants (thousand MW)	54.1	57.5	60.7	61.9	64.0	64.7	66.6	3.5

Source: Ministry of Energy, Electricity Industry Data in 50 Years.

¹ The actual output of a power plant is defined as the highest accessible capacity considering the environmental conditions.